megaspore mother cell; the appearance of an ordinary tetrad; the formation of a chalazal haustorium by the embryo sac, into which the three persistent and very active antipodal cells pass; and the development of a massive supsensor from the filamentous proembryo. The anatomical details are fully presented, and are directed chiefly toward taxonomic distinctions. The "biological" topics deal with the influence of various conditions (especially mesophytic), the crystals of calcium oxalate, starch, tannins, and elaeagnin. The taxonomist will discover that the three genera are quite justifiable, and will receive no shock upon finding that the family belongs just where it is now located in the ENGLER sequence.—J. M. C.

**Cretaceous conifers.**—The remarkable results obtained by HOLLICK and JEFFREY from a study of the plant remains preserved in Cretaceous clays of Staten Island have now been published.[19] Much of the material consisted of fragments of lignite, and this required the development of a special technic, which is described. Structural material of leafy twigs and cone scales was also secured. The recent and rapid organization of vascular anatomy as a scientific instrument is well exemplified in this memoir, not only in the identification of material, but still more in the interpretation of its significance.

The descriptions of specimens include three genera of Abietineae, Pinus (3 spp., 2 new), Prepinus (1 sp.), and Pityoxylon (1 sp.); but most important is the surprising display of Araucarineae, 16 genera being included, 9 of which are described as new (*Androvettia*, *Raritania*, *Eugeinitzia*, *Pseudogeinitzia*, *Anomaspis*, *Sphenaspis*, *Dactyolepis*, *Pityoidolepis*, *Brachyoxylon*), the remaining 7 genera being Widdringtonites, Thuites, Brachyphyllum, Geinitzia, Protodammara, Araucariopitys, and Araucarioxylon.

The great interest of these results lies in their bearing on the relationship of araucarians to the other conifers. The remains investigated include many that have been referred heretofore, from the appearance of their leafy branches or of their cones, to Taxodineae, Cupressineae, and Podocarpineae. The conifers referred to these tribes are now shown, by the microscopic structure of their leafy twigs and cone scales, to be araucarians, and represent a special subtribe, for which the name Brachyphylloideae is proposed. They are characterized by a special type of wood, the Brachyoxylon type, which is said to "ally them with both the Araucarineae (in the narrower sense) and the Abietineae." The authors believe that the araucarians of today have come from abietineous ancestors through Brachyphylloideae. The species of Pinus investigated are in general more archaic than any living species, and Prepinus shows structural features more primitive than in any other living or extinct conifer.—J. M. C.

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[19] HOLLICK, ARTHUR, AND JEFFREY, EDWARD CHARLES, Studies of Cretaceous coniferous remains from Kreischerville, New York. Mem. N. Y. Bot. Garden 3: viii + 138. *pls. 29.* 1909.